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## Interior Features

**Model:** E52

**Production Date:** 03/00 To Present

### Objectives of the Module

After completing this module, you will be able to:

- Perform proper removal of a door panel.
- Describe the Instrument Cluster and IKE functionality.
- Understand gauge functions.
- Perform instrument cluster self test.
- Understand the IHKS control panel operation.
- Describe the differences of the Z8 IHKS compared to previous IHKS systems.

## Center Console

### Purpose of the System

The center console provides layout for various control switches. It can be accessed by removing the parking brake lever cover boot and carefully prying up on the console.

### System Components

- SPORT SWITCH - When pressed, the indicator light is on and signals the ECM for a sport throttle operation mode (same as M5). If not selected, a comfort throttle mode will be in operation (reset back to this position each time the ignition switch is cycled).
- HAZARD SWITCH - Activates the hazard lights, also used to reset the hazards after an impact.
- CENTRAL LOCK - When the doors are closed, pressing the button activates the door locks (single lock). pressing the button again, or pulling the interior door handle twice will open the door(s).
- CONVERTIBLE TOP SWITCH - Lowers and raises the soft top.

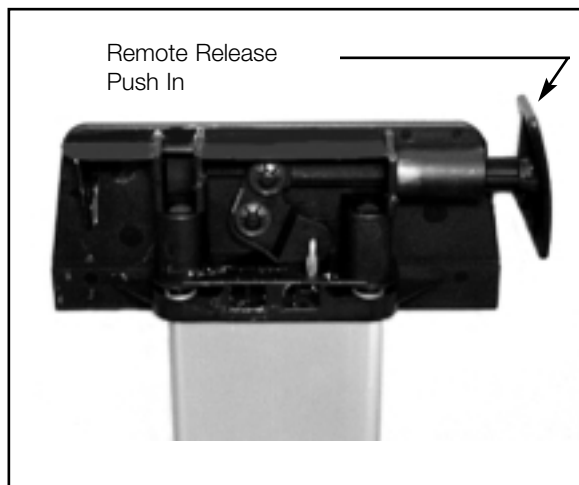
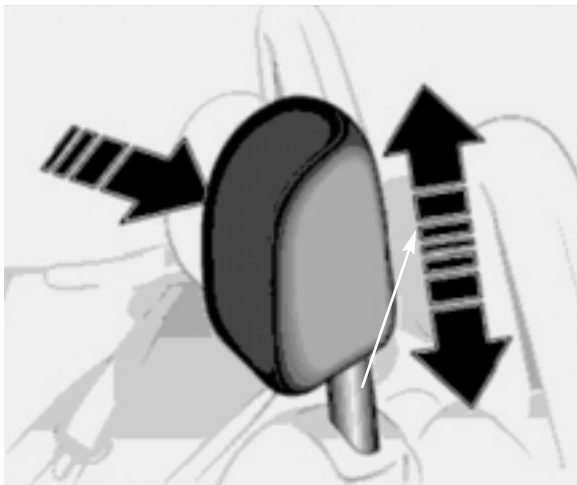
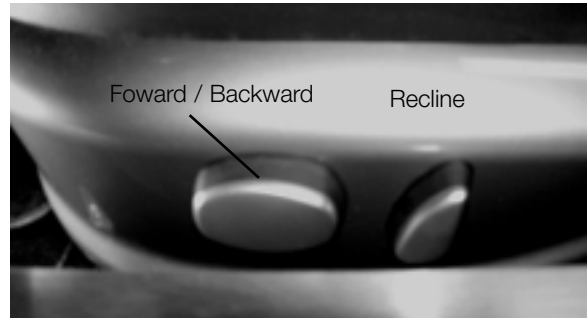


The two position Seat Heater Switches are located on the left and right sides of the center console as shown above.

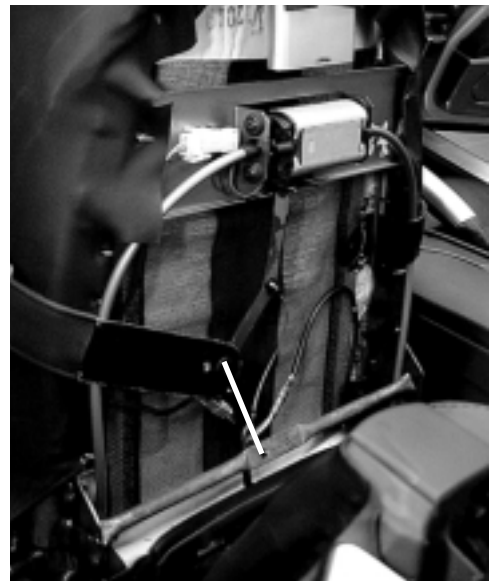
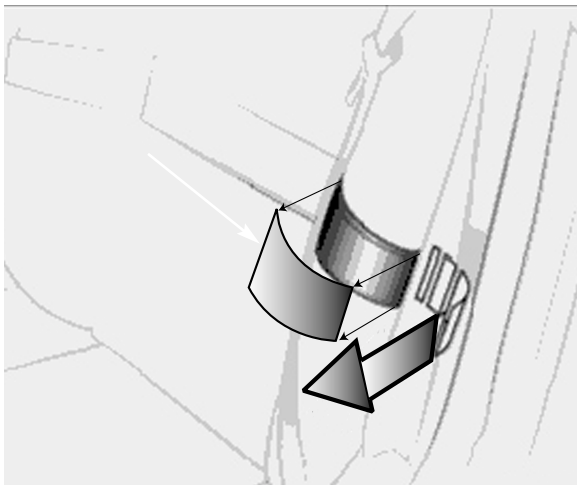
## Seats

The seats are power operated (driver and passenger) for base raising, forward/backward, and recline positions. The Z8 seats do not have "seat memory".

The headrest can be manually raised, but there is a remote release (rightside headrest cushion) to lower the headrest.



To access the navigation cd or compact disc changer compartments, pull the release strap to fold the seat forward.



## Doors



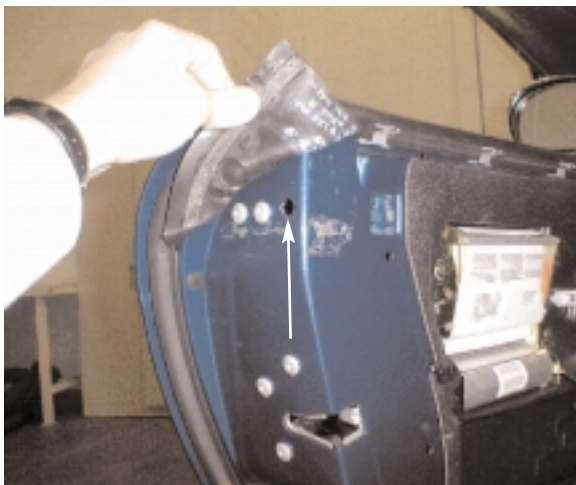
The doors panels are fitted with storage “pockets”

The passenger door is fitted with a manual locking knob (indicated on the left) which can lock the door if the vehicle battery were to fail.

Simply slide the knob downward and close the door. It can not be opened from the outside.

In this position, the door can be opened from the inside by pulling the inside door handle twice.

The driver’s door can then be locked with the key .



To remove the door panels, an additional torx screw at the rear of each panel (arrow in the left diagram) needs to be removed in addition to the traditional fasteners.

## Secure Storage

Secure lockable storage compartments are provided behind each seat.

These compartments are manually locked with a master key (indicated by arrows on the right and lower right).

Shown to the right is the Navigation cd unit with fuse box and manual trunklid release.



Shown to the right is the sound system CD Changer with the flash light and charging socket which is located behind the driver's seat.

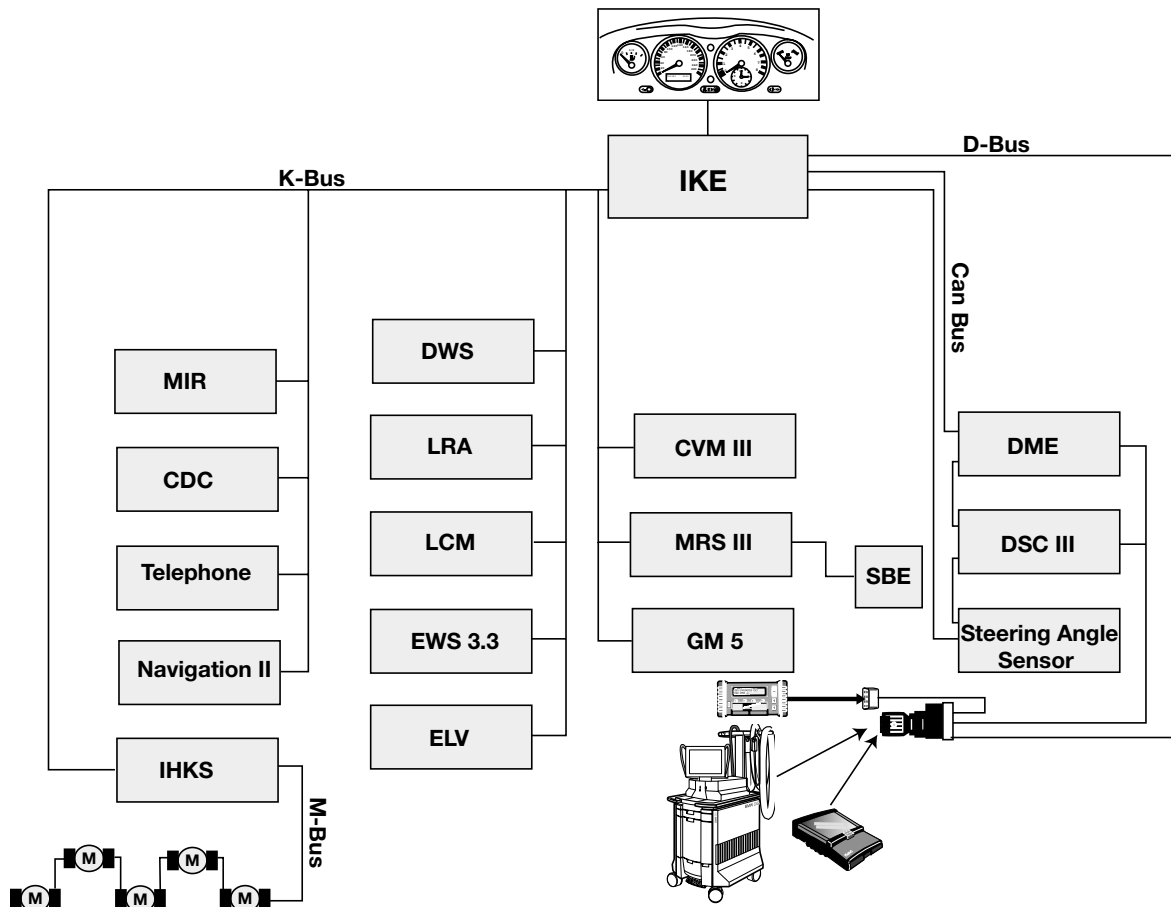


## Instrument Cluster

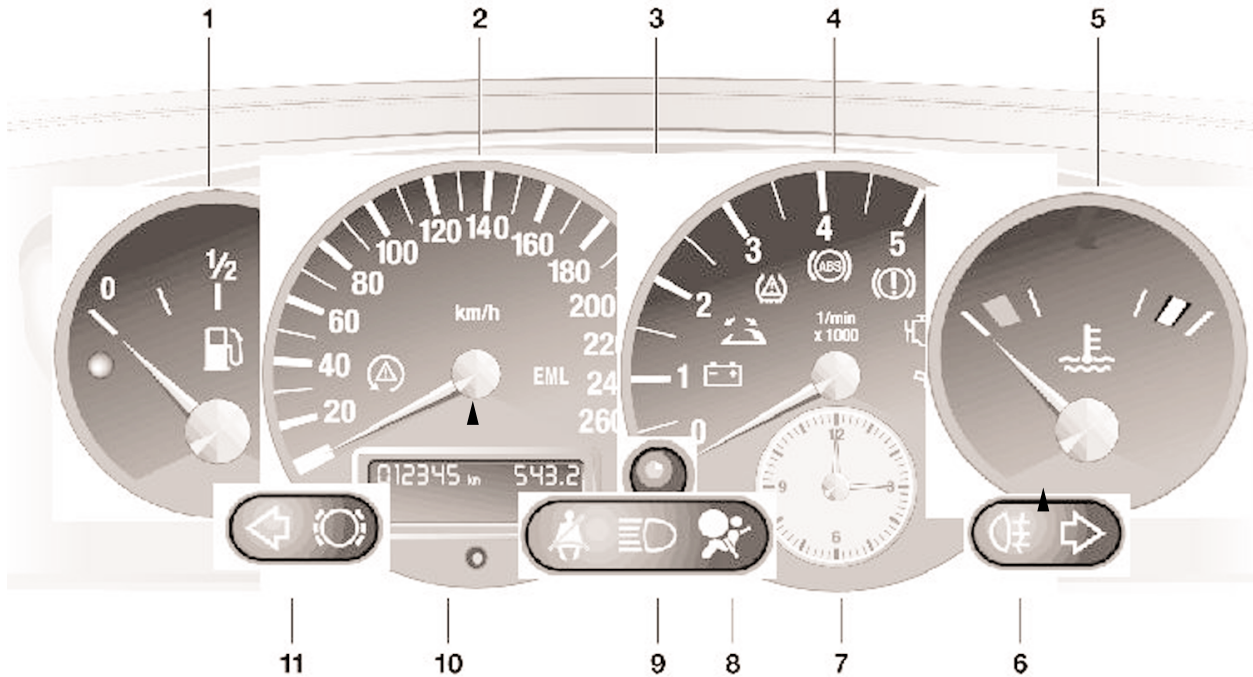
### Purpose of the System

The instrument cluster displays status information about different operating systems in the vehicle. The information is received using Dial gauges, LCD display, Warning LEDs and Gong tones.

- Z8 instrument cluster is based on the E39 technology (base version). Due to the limited space available in the Z8, the indicator instruments have been separated from the electronics. The resulting indicator modules are connected with the electronic control (instrument cluster module) through a separate wiring harness.
- The instrument cluster consists of 7 modules, 4 modules with pointer instruments (stepper motor driven) and 3 modules with displays and control. The instrument cluster control module (IKE) contains the necessary electronics to control the modules.
- The IKE is connected to the vehicle wiring harness and contains the three bus interfaces - Diagnosis bus, K-bus, and Can-Bus.



## System Components



1. Fuel gauge with reserve light
2. Speedometer with indicator and EML/DSC warning lights
3. Dimmer control for instrument cluster lighting
4. Tachometer with indicator and warning lights: charging system, convertible top, DWS, ABS, handbrake/brake fluid/CBC, service engine soon, engine oil pressure and level
5. Coolant temperature gauge with over heat light
6. Direction and rear fog light indicator
7. Analog clock
8. Clock and trip odometer reset knob
9. Seat belt, high beam, and SRS warning lights
10. Odometer, trip odometer, and Service Interval digital display
11. Directional and brake lining indicators



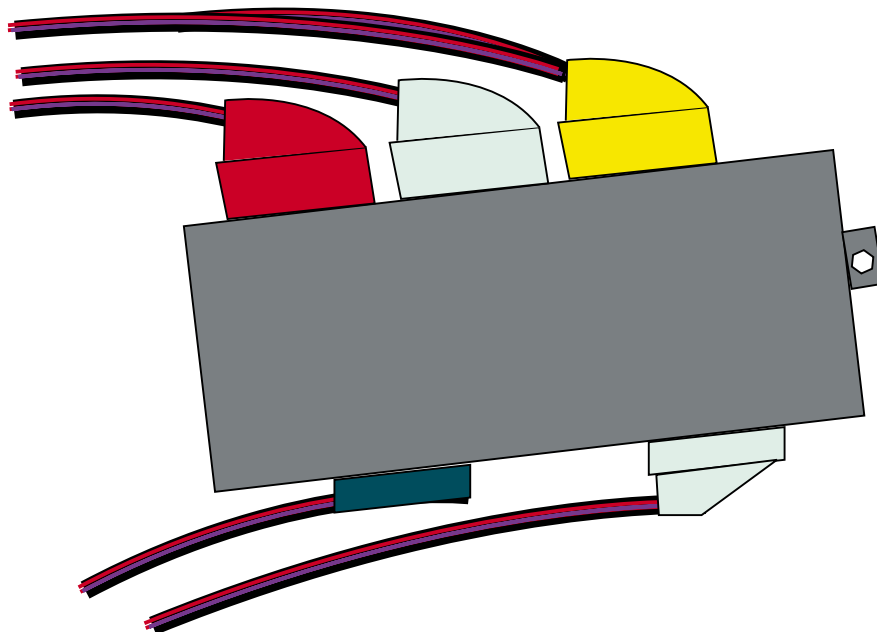
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The instrument cluster is divided into module components, shown below is the rear view of the instruments.

- To remove the instrument cluster: carefully pry out the dash side panels (driver's and passenger's), and remove the four corner screws.



- The instrument cluster assembly is hard wired to the IKE module which is located behind the glove box.



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## **Instruments, Indicators and Displays**

### **Speedometer**

The speedometer module is equipped with different indicators corresponding to the country-specific variant. The distance pulse for indicating the road speed comes from the DSC control module. The input to the DSC III originates from the rear left wheel speed sensor.

### **Tachometer**

The tachometer is controlled by the IKE (rpm signal supplied by the ECM). The engine speed information is made available to the other control units via the K-bus.

### **Clock**

The time is indicated by a classic looking analog clock (refer to control knob for setting).

### **Fuel Gauge**

The level in the fuel tank is measured with a lever-type sensor that is connected to the IKE using a dedicated ground terminal and sensor circuit. The level sensor does contain a reserve contact. The fuel reserve warning light is activated by the IKE based on the low level of the sensor. The "fuel reserve" signal is additionally output as information for the engine management. The level sensor is designed for the shape of the tank by the resistance characteristic curve and IKE coding data.

### **Coolant Temperature Gauge**

The coolant temperature is measured in the Engine Control Module (ECM) and is sent via the CAN-bus to the IKE for the instrument modules. The coolant temperature information is also provided to other systems on the K-bus. The IKE also determines the coolant temperature with a separate NTC sensor. This temperature is indicated in the coolant temperature gauge during the initialization phase of the CAN-bus. To prevent "heat surge" from affecting the gauge after a hot engine restart, the IKE buffers this circuit. If the IKE detects a higher temperature on restart compared to when the engine was switched off, the value stored at "engine off" is indicated. The current value will be displayed approximately 20 seconds after restart.

### **Coolant Overheat Warning**

The IKE activates on the coolant overheat warning light for 2 seconds when the ignition is switched on (pre-drive check). It is then controlled by the engine control module via the CAN-bus. If the coolant overheat warning light is activated by the engine control module, this CAN message is made available to other modules on the K-bus. The IKE receives the value via the CAN-bus and if the maximum value is reached, the gauge needle is moved in the center of the red warning zone.

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## **Service Interval Display (SIA4)**

The Service Interval Display (SIA4) is a consumption-dependent distance-based inspection display with the ability to indicate remaining distance. It serves the driver and the workshop as an indication showing when an engine oil service or distance based inspection is due. The current Service Interval status is indicated as from ignition "terminal 15 ON" for up to 10 seconds after reaching a minimum engine speed of 400 rpm. The SIA4 data is also stored in the light check module (LCM). The SIA4 can be reset like current BMW models. Each reset can be carried out independent of each other, oil service or distance inspection reset.

## **Total Distance and Trip Odometer**

The current trip odometer reading is shown in the display from ignition terminal R "ON". When terminal R is switched "OFF" the odometer reading (total mileage) can be displayed for approx. 25 seconds by pressing the trip odometer reset button and then releasing it. The total distance is made available on the K-bus which is stored in the IKE and in the LCM.

## **Ambient Temperature**

The IKE determines the current outside temperature based on the outside temperature sensor (NTC resistor). The outside temperature sensor has a dedicated ground and sensor circuit to the IKE. The "outside temperature" information is transferred from the instrument cluster on the bus and is displayed by the multifunction radio (MIR). When the ignition is switched off, the outside temperature sensor is read in timed minute intervals by the IKE. For this purpose, the IKE is activated for a short time, it makes available the "outside temperature" information and then switches off again (sleep mode).

## **Instrument Light Dimming**

The instrument lights and the digital display lighting are dimmed in different ways. The pulse width modulated signal (58g) from the LCM is used for instrument light dimming. With the lights switched off, the brightness information from the phototransistor (integrated in the speedometer) is used for the purpose of controlling and adapting the lighting of the digital display to the ambient conditions. With the lights switched on, the lighting intensity can be additionally varied with the dimmer within a limited range. In this case, the ambient light information provided by the phototransistors has priority in controlling the intensity of the lights.

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## Warning and Indicator Lights

*General information:* light emitting diodes (LEDs) are used to backlight all warning light symbols. Two-colored LEDs are used for symbols that can light up red or yellow.

### General Brake Warning Light

Illuminated red when:

- Parking brake applied with ignition switched on.
- Brake fluid low level warning via bus signal from the LCM.
- Malfunction signal on CAN-bus from DSC to the IKE.
- Electronic brake pressure distribution (EBV) failure warning from DSC control unit.

Illuminated yellow when:

- Malfunction warning on CAN-bus brake assistant from DSC control unit.

During the pre-drive check, the warning light is illuminated red and yellow for 1 second provided the function for the brake assistant is coded, otherwise the warning light will be illuminated only in red for 2 seconds. If the parking brake is applied, only the red warning light will be illuminated.

The warning light can light up yellow only when there is no warning for red. The DSC switches on the yellow warning light via the CAN-bus if the DSC detects a malfunction in the brake assist.

### Seat Belt Indicator Light

The seat belt indicator light is activated when ignition terminal 15 is switched "ON". The LCM sends a K-bus signal until the seat belt is latched (contact is opened).

### Indicator Lights

Direction indicator, high beam, and the rear fog light indicator lights are switched by means of a corresponding bus message from the LCM to the IKE.

### Charge Indicator Light

The warning light is activated by the compact alternator when there is no charging output to the IKE.

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## **Oil Light**

The red warning light is activated by the oil pressure switch.

The yellow warning light is activated by a K-bus message from the LCM to the IKE. The engine control module (ECM) evaluates the signal from the oil level sensor in the engine and sends a CAN message to the IKE.

The IKE converts the message and passes it on to the LCM via the K-bus. The LCM compares the signal to coded data and sends a K-bus message to the IKE. The IKE activates the oil level warning with priority given to the oil pressure warning.

The oil indicator light is illuminated yellow under following conditions:

*Oil level sensor defective:* The oil level sensor is monitored by the ECM, and if a defect is detected, a message is sent to the LCM that is stored in fault memory. The LCM switches on the oil indicator light (yellow for oil level warning) for 30 seconds via the K-bus. This fault is set with ignition "ON", engine speed and oil pressure must have been detected.

*Low oil level detected:* Low oil level is detected by the ECM only when the engine is running and a message is sent to the LCM. This information is stored in the LCM and activates the yellow oil level indicator light for approximately 30 seconds after the ignition has been switched off.

*Oil loss recognized:* Oil loss is detected by the ECM only when the engine is running. Consequently, the LCM immediately switches on the yellow oil level indicator light.

## **ABS Indicator Light**

The warning light is activated by the ABS/DSC system. The warning light must also be activated if a signal line is interrupted.

The circuit logic is:

- Low signal (ground) = warning light off.
- High signal (system voltage) = warning light on.
- High signal (high resistance, break) = warning lamp on, recognizes a break or interruption in the signal line.

## **SRS Indicator Light**

The SRS warning light is activated by a ground signal from the SRS control module for pre-drive check as well as system faults.

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## **Service Engine Soon Light**

The "Service Engine Soon" warning light is activated by the ECM via the CAN bus. The light is illuminated for pre-drive checks as well as emission related faults.

## **Warning Light for Automatic Stability Control (DSC)**

The "ASC" warning light is switched by the DSC system via the CAN-bus. As a function check after switching on the ignition, the DSC switches on the warning light for a limited period of time (pre-drive check).

## **Warning Light for Tire Pressure Warning (DWS)**

The tire failure warning light is switched by a corresponding bus message from the tire pressure warning system (DWS) to the IKE. As a function check, the warning light is activated for 2 seconds (pre-drive check).

The "EML" warning light is activated by the ECM via the CAN bus. If EML message is not received on the CAN-bus from the ECM to the IKE, the warning light is switched on for 1.5 seconds after switching on the ignition (emergency running value).

## **Brake Lining Warning Light (BBV)**

The brake lining warning light is located in the left direction indicator and is activated by the IKE. As a function check, the warning light is switched on for approx. 2 seconds after the ignition is switched on (pre-drive check). The sensors consist of a circuit loop in the rear right and front left brake pads (connected in series). When the brake pad is worn, the circuit loop is interrupted (recognized by the IKE) and the warning light is activated. The warning is cancelled if the interruption is not detected for 30 seconds after ignition "ON" with the engine not running.

## **Convertible Top Warning Light**

The convertible top warning light is activated by the Convertible Top Module (CVM III) via a circuit line. The warning light illuminates when the convertible top is operated, and flashes if the convertible top is not locked in either end position.

## **Lights On Warning**

The audible warning for the lights "ON" and the indicator clock is installed in the speedometer module. The "lights ON" warning sounds for 8 cycles (one cycle = 500 ms "ON" / 500 ms "OFF") when the ignition is switched off, the driver's door is opened for the first time and the instrument lights are switched on. The message to trigger the "lights ON" warning is read via the K-bus and is controlled by the IKE.

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## Ignition Key Warning

The "ignition key warning" function is activated by the IKE. Based on a K-bus message, the LCM triggers the audible warning. The ignition key warning is triggered when the ignition is switched off and the driver's door is opened. The warning is immediately cancelled if the IKE receives a message from the LCM.

## Acoustic Cycle for Direction Indicators

The acoustic generator for the direction indicators and the lights "ON" warning is installed in the speedometer module. The IKE activates the acoustic relay synchronously with the left and right direction indicator lights as well as the direction indicators. The "direction indicator" information comes from the LCM via the K-bus that also controls the synchronization. If a bulb failure is detected in a direction indicator, the IKE is informed by a K-bus message. Both indicator lamps are activated at twice the normal cycle frequency.

## Gong

The IKE controls the tone 3 (T3) in the gong. An acoustic warning is output for the seat belt warning, ignition key warning, hand brake warning, tire pressure warning and speed warning. Depending on the type of warning, a short tone 3 (T3) is output repeatedly or only once.

*Acoustic seat belt warning:* an acoustic seat belt warning is possible only in conjunction with a driver's seat belt buckle contact. The warning is activated by the LCM via the K-bus. When the belt contact is opened, the IKE activates the gong tone 3 (T3) intermittently for a maximum of 6 seconds after switching on the ignition. The gong is deactivated if the seat belt is buckled before this period of time has elapsed.

*Acoustic ignition lock warning:* the ignition key warning is triggered for a maximum of 60 seconds if the driver's door is opened with the ignition switched off.

*Acoustic speed warning:* a speed warning is triggered by the IKE. If the speed threshold is exceeded, a short tone 3 (T3) sounds in the gong. If the speed drops below this threshold by more than 5 km/h, the tone will be triggered again upon exceeding the threshold.

*Acoustic parking brake warning:* a parking brake warning is triggered at the gong as soon as the handbrake is applied and a road speed of more than 3 km/h is detected. The intermittent tone sounds for as long as the warning condition is applied or maximum 20 seconds.

*Acoustic tire pressure warning:* the tire failure warning light is activated via the K-bus from the tire pressure warning system to the IKE. An acoustic warning in the form of the single tone 3 gong is triggered provided the ignition is switched on.

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## System Operation

### Test Functions

To access the test functions, the key must be in the accessory position. After the ignition switch is placed in the accessory position (terminal R), the odometer reset button must be pressed within 5 seconds and held in until the test functions appear.

Test No.	Function
1.	Identification of control unit for instrument modules (sub tests 1.1-1.7)
2.	System test (2 sweeps)
3.	SIA data
4.	Current consumption values in 1/100 km and l/h
5.	Not used
6.	Fuel tank contents value
7.	Coolant temperature, outside temperature, current engine speed, current road speed.
8.	ADC values (system voltage, lever-type sensor voltage, left and right, phototransistor voltage and BVA, voltage terminal 30 in Volt.
9.	System voltage terminal 30 in Volt.
10.	Read out country code.
11.	Read out units (AM / PM or mm.dd/dd.mm) etc.
12.	Not used
13.	Trigger acoustic signals
14.	Read out error bytes (self-diagnosis)
15.	Display of I/O port statuses
16.	Dimmer value (lights on)
17.	Internal clock
18.	Not Used
19.	Lock and release test functions
20.	Not Used
21.	Reset instrument cluster (software reset)
0.	End of test, test mode can be exited via this function



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## Workshop Hints

### Replacing the IKE

The four examples described in the following section outline the procedure, conditions, and measures to ensure trouble-free repair of the instrument cluster.

*Example 1:* the IKE is defective and the LCM is OK.

- Replace the IKE (new part).
- The manipulation dot is set with the ignition switched on.
- The manipulation dot is set as the vehicle identification number in the LCM differs from the vehicle identification number in the IKE.
- Re-encode the IKE.
- Encode the IKE in accordance with the central encoding code.
- Encode the vehicle identification number in the IKE. If the vehicle identification number is not encoded in the IKE, the total distance will not be recorded either in the IKE or in the LCM.
- Switch the ignition off and on again. The manipulation point goes out, the IKE adopts the total mileage and the SIA4 data from the LCM. The information exchange between the IKE and the LCM for joint data storage (SIA data, total mileage, vehicle identification number) is taken over.

*Example 2:* the IKE is OK and the LCM is defective.

- Replace the LCM (new part).
- The manipulation dot is set with the ignition switched on.
- The manipulation dot is set if the vehicle identification number in the LCM differs from the vehicle identification number in the IKE.
- Re-encode the LCM in accordance with the central encoding code.
- Encode the vehicle identification number in the LCM, the total distance will not be recorded in the LCM as long as the vehicle identification number is not encoded in the LCM.
- Switch ignition off and on again. The manipulation dot goes out, the LCM adopts the total mileage and the SIA4 data from the IKE. The information exchange between the IKE and the LCM for joint data storage (SIA data, total mileage, vehicle identification number) is taken over.

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*Example 3:* the IKE and the LCM need to be replaced.

**Note:** *Replace both control modules at the same time only when necessary (total mileage recording will be irretrievably lost).*

- Replace the IKE and LCM with the battery disconnected (new parts).
- When the ignition is switched on, the manipulation dot is set and the total mileage is set to zero. The previous total mileage is irretrievably lost.
- Encode the IKE and LCM in accordance with the central encoding code.
- Encode the vehicle identification number in the IKE and in the LCM.
- Switch ignition off and on again. The manipulation dot goes out, the LCM adopts the total mileage and the SIA4 data from the IKE. The information exchange between the IKE and the LCM for joint data storage (SIA4 data, total mileage, vehicle identification number) is taken over.

*Example 4:* the IKE or the LCM is to be replaced as a “diagnostic test”.

**Note:** *Although, in principle, replacing one of the two control units as a test is possible, it should be avoided.*

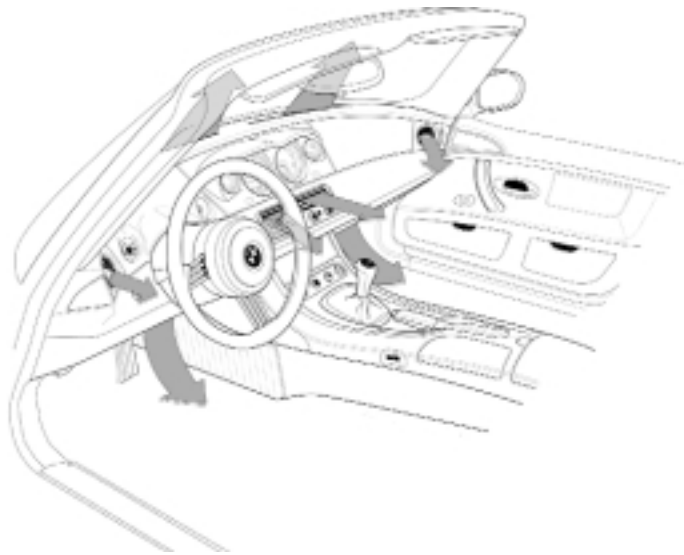
- The IKE or the LCM from another vehicle is installed for testing purposes.
- When the ignition is switched on, the manipulation dot is set and the IKE continues to record the total mileage. The total mileage is only recorded in the IKE as long as the vehicle identification number differs. There is no total mileage transfer to the LCM.

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## IHKS - Heating and Air Conditioning

### Purpose of the System

An integrated heating/air conditioning control system (IHKS) is used in the Z8 to provide the driver and passenger a comfortable atmosphere regardless of conditions outside the vehicle. The heater/air conditioner is designed as an air-based control. 6 actuators are used to distribute the air and control the temperature.



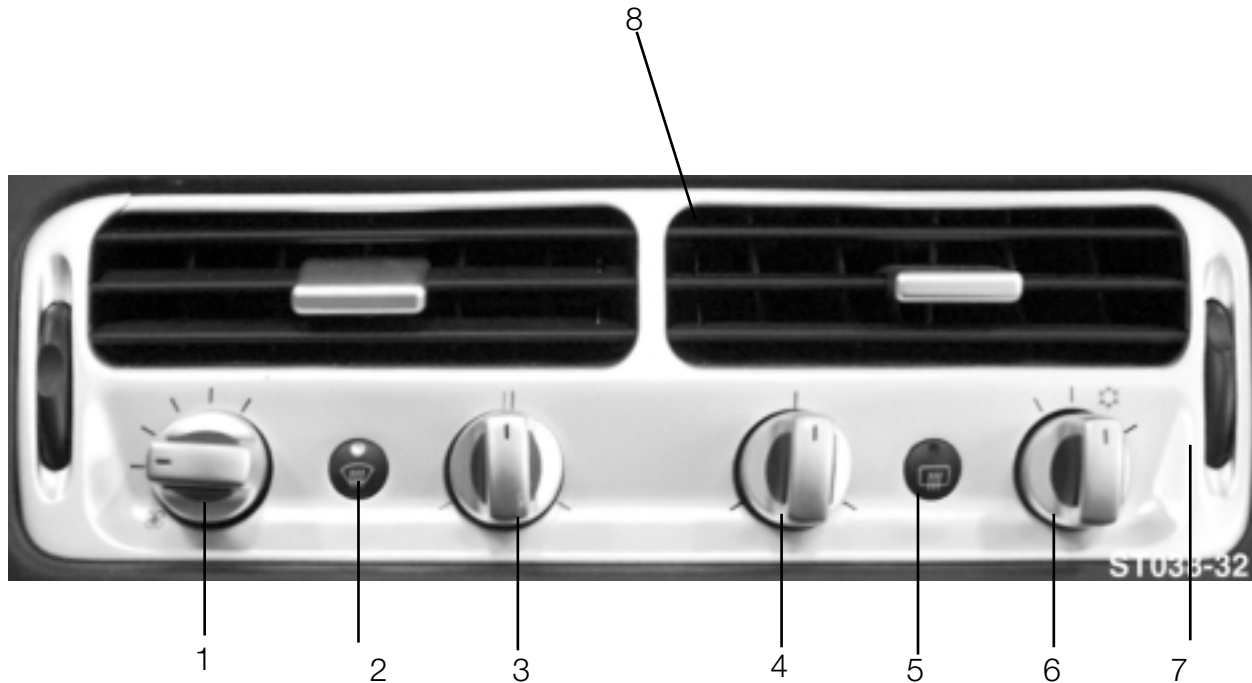
### System Components

The IHKS consists of the following main components:

- Electronic Control panel/module with integrated fresh air grille
- Heater/air conditioner unit
- Five actuators (bus stepper motors) for controlling the recirculated air, temperature mixing, defroster, face vent and foot-well flaps
- One actuator (high speed stepper motor) for controlling the fresh air flap
- Electric shut-off water valve
- Electric auxiliary water pump
- Refrigerant pressure sensor
- Evaporator temperature sensor
- Rear window defogger relay
- Series resistors for blower motor

## IHKS Control Panel

The interior temperature, fan speed, and air distribution are set with classic rotary knobs and push buttons. The setting request are processed by the integrated electronics.

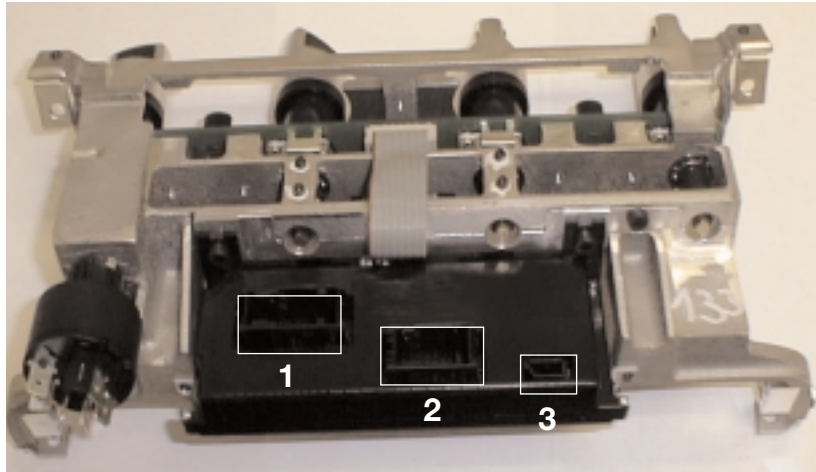


Number	Description
1.	Blower setting (5-stage rotary switch, including off)
2.	Defrost button
3.	Temperature setting (potentiometer)
4.	Air Distributor (potentiometer)
5.	Rear window defroger button (if hardtop fitted)
6.	A/C Program selector switch (potentiometer)
7.	Air flow control
8.	Fresh air grille

## Control Panel - Connections

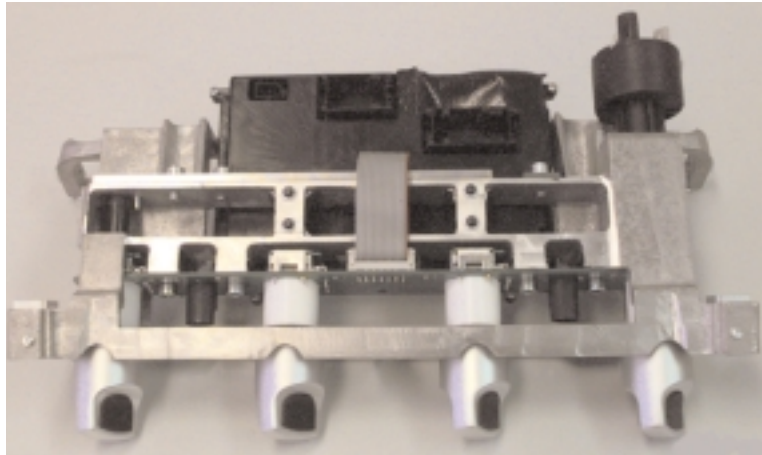
A total of 3 plug connections are integrated in the IHKS control module.

The fourth is a separate connection to the blower switch.



The IHKS control module is located on the back of the control panel.

The Z8 IHKS can be coded and diagnosed via the DIS/MoDIC.



## Blower Setting

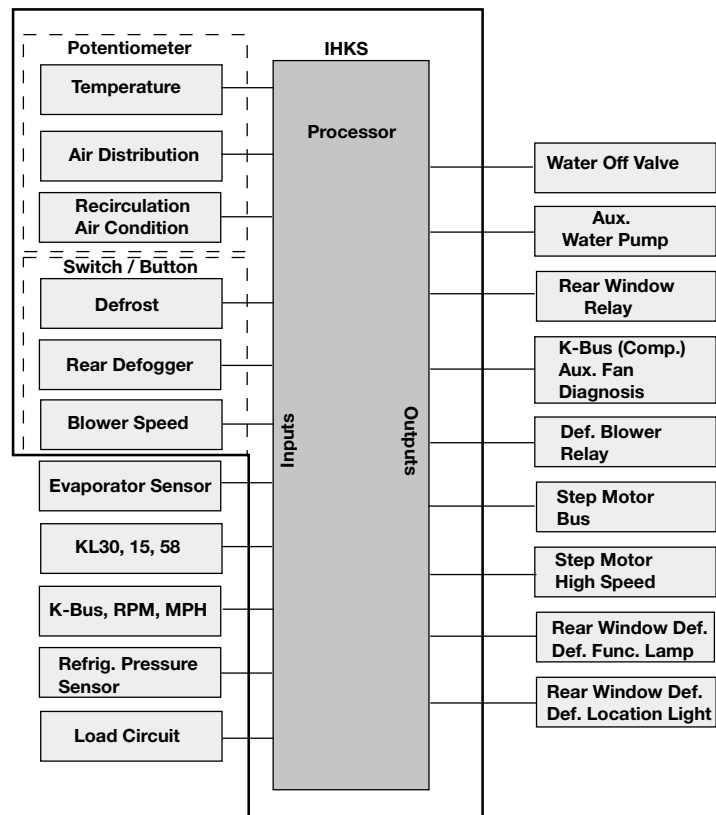
The blower control is designed as a 5-stage switch (including off). When the blower switch is set to the zero position all flaps are closed and the refrigerant circuit is switched off automatically.

The IHKS features “ram” air compensation in which the fresh air flap is increasingly closed as the vehicle speed increases thus making it dependent on the type of top used (hardtop or soft top). The fresh air flap is operated by a high speed stepper motor. The IHKS receives information (via the K-bus) as to whether the soft top is open or closed.

## System Operation

Functions:

- Blower control
- Temperature control
- Recirculated air/fresh air mode
- Air conditioner mode
- Defroster function
- Air distribution
- Rear window defogger

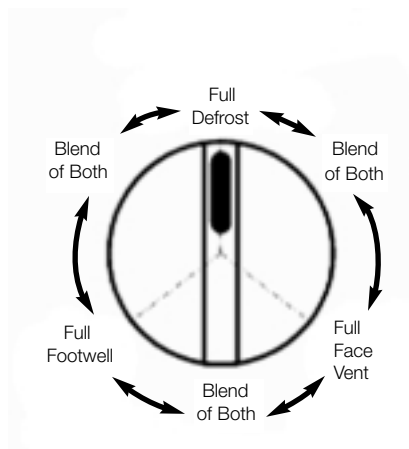


*Note: If the IHKS control module is replaced, it must be recoded.*

## Air Distribution

The air flow is adjusted by a 360° potentiometer. The flaps are controlled by 3 stepper motors (bus) that operate the defroster, face vent and footwell flaps. Flap control is dependent on the position of the air distribution knob as well as the position of the temperature knob.

Different characteristic curves are used for the maximum warm setting and the maximum cold setting. If the temperature control knob is anywhere between these two settings, the new flap position is set.



## Flap setting

The stepper motors for flap operation execute a position run after ignition terminal 15 has been switched off. The fresh air and defroster flaps are completely opened, and all other flaps are closed.

The temperature setting flap is the only flap that remains unchanged. This procedure lasts approximately 15 seconds.

The IHKS performs a calibration run after every 20th time the ignition is switched off or after an interruption in memory power. The flap end positions serve as reference points.

A total of five (200 Hz) stepper motors with M-bus activation and one (500 Hz) high speed fresh air motor are used.

	IHKS Off (KL 15 on)	Defroster function	IHKS OFF (KL 15 off)
Fresh air	Closed	Open	Open
Recirculation	Closed	Closed	Closed
Defrosting	Closed	Open	Open
Ventilation	Closed	Closed	Closed
Footwell	Closed	Closed	Closed
Temperature	Unchanged	Maximum	Unchanged

## Auxiliary Water Pump

An auxiliary water pump is installed to ensure the necessary water flow rate at low engine rpm.

The auxiliary water pump is switched on when the following conditions are fulfilled:

- Water valve is opened (de-energized)
- Engine rpm < 2000 rpm
- Engine temperature > 32 °F
- Start procedure completed (terminal 50)

The auxiliary water pump is switched off when, apart from the engine speed that must exceed 2500 rpm, at least one of the above conditions is not fulfilled.

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## **Temperature Control**

The rotary knob locks in both end positions. The temperature is set by means of a mixing flap that is operated by a stepper motor (bus). The temperature control potentiometer can be turned through an angle of 240°.

The water valve is closed when the control knob is set in the minimum position. From the 10 o'clock position (potentiometer value) on, the water valve is opened and the auxiliary water pump switched on.

## **Air Conditioning**

The air conditioning is requested by a combination switch. The IHKS activates the A/C compressor magnetic clutch, and cool air flows from the evaporator. With the aid of a temperature mixing flap, this air is blended with warm air from the heater core.

To prevent the evaporator surface from icing up, the evaporator temperature sensor signals the IHKS to deactivate the compressor clutch. The switching threshold is set at approximately 1 °C (34 degrees F).

## **Idle Speed Compensation**

The Engine Control Module (ECM) compensates the idle speed to ensure smooth operation of the engine at idle.

The IHKS will signal the ECM for idle speed compensation when at least one of the following conditions occurs:

- Rear window defogger switched on (hardtop fitted)
- Blower set to max. position
- Air conditioning switched on

## **Filling Station Effect**

The filling station effect corresponds to the heater core “hot soak”, because the water valve is sprung open with out power. In order to avoid this effect, after ignition terminal 15 is switched off, power is still applied to the water valve for 5 minutes.



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## **Characteristic Map Cooling**

Characteristic map cooling is not used in the Z8 with the S62 B50 engine.

## **Defroster Function**

The defroster function has priority over other functions. It has the task of defrosting the windshield as fast as possible.

The following functions are activated for this purpose:

- The temperature is set to maximum warm.
- The blower speed is set to the highest stage.
- Defroster flaps fully open.
- All other air distribution flaps are closed.
- The fresh air flap is fully opened (recirculated air closed).
- The water valve is opened.
- The auxiliary water pump is switched on.

## **Rear Window Defogger**

This function is active only in conjunction with the hardtop. During the defrost phase the heating is fully powered for 17 minutes.

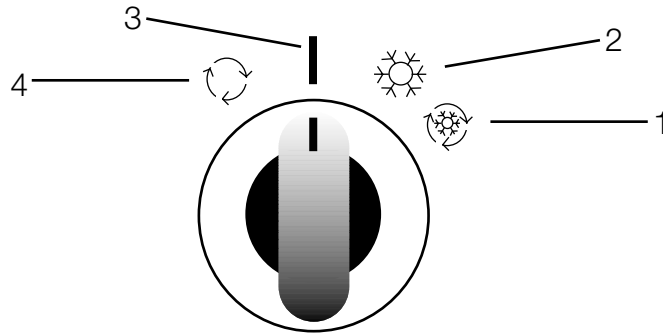
If the defrost phase is not sufficient to completely defrost the rear window the heating can be activated for a further 5 minutes by pressing the rear window defogger button again.

If the heating is switched off for any reason the timer is stopped so that defrosting can continue from exactly this point when switched on again.

The rear window defogger is completely deactivated when the unloader function is active (starting the vehicle).

## Program Selector Switch for Recirculated Air, Outside Air, A/C Functions

The functions are selected by a rotary knob with 4 settings. Each setting corresponds to a program.



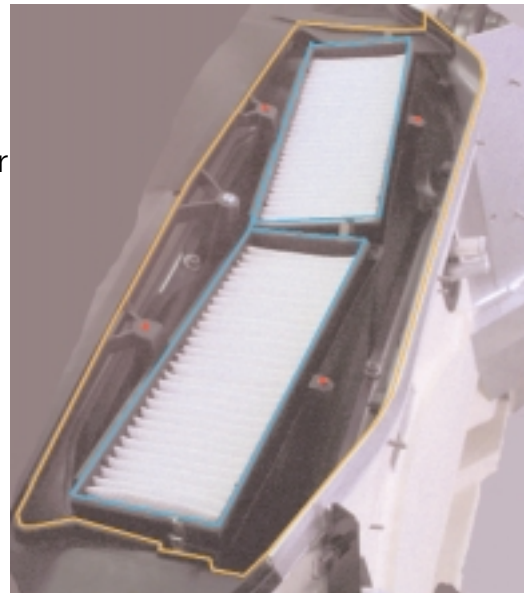
Setting	Function
1	Recirculating air with air conditioning
2	Outside air with air conditioning
3	Outside air
4	Recirculating air

The recirculation air control flap is operated by a stepper motor (bus).

## Filters

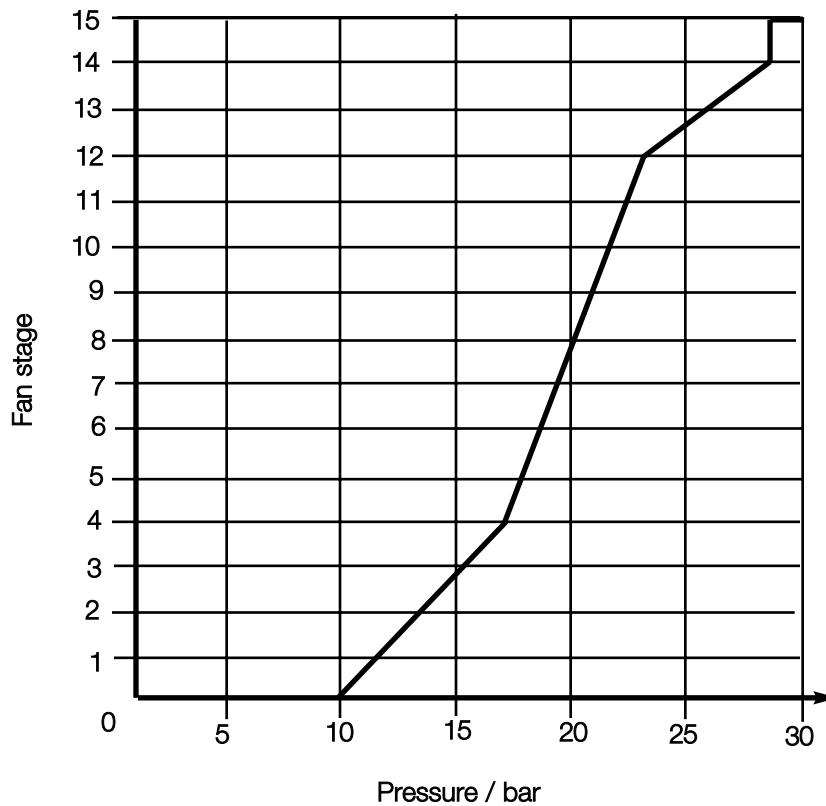
The micro-filters are located under the hood.

To service the micro-filters, simply remove the four torx screws and remove the cover panel.



## Auxiliary Fan

The auxiliary fan stage (speed) is determined from the refrigerant pressure sensor signal. The IHKS signals the ECM via the K-bus, and the ECM will activate the auxiliary fan. The fan stage (speed) is generally set to 0 at vehicle speeds above 50 mph (ram air).



## K-bus Interface

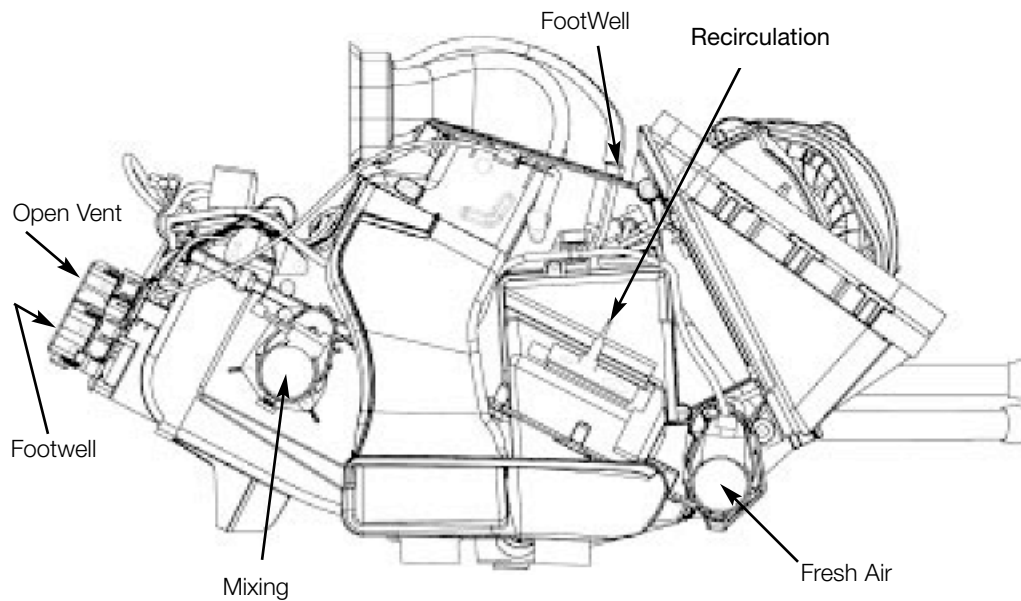
This interface transmits data such as the vehicle speed, engine speed and diagnosis between the IHKS control unit and the IKE.

The K-bus is also used to transmit compressor load values as well as auxiliary fan request from the IHKS through the IKE then over the can line to the ECM.

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## Heater/Air Conditioner Housing

The heater/air conditioner housing design is based on the E36/7. To compliment the lightweight and compact design, stepper motors are used to operate the flaps.



## Diagnosis

All inputs and outputs are monitored by the IHKS control module. Faults are stored in the EEPROM after terminal 15 has been switched off. Faults that occur sporadically can be deleted by the IHKS control module after successful self-repair. However, the entry "sporadic fault" is retained.

Unlike previous IHKS systems, the Z8 version is diagnoseable via DIS/MoDIC.

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## Review Questions

1. How do you lower the head rests?

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2. Are the Navigation and CD storage compartments electrically or manually locked?

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3. What module is used for instrument cluster (IKE) data back up storage?

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4. What is unique about the Z8 IHKS system as compared to previous IHKS system?

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5. What test step allows unlocking the IKE to perform all of the cluster self diagnostics?

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